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ABSTRACT

The question of why language acquisition is not instantaneous is addressed in terms of two related issues: the logical and the developmental aspects of language acquisition. The role of linguistic theory and research in determining the interplay of these two aspects of grammatical development is examined. It is suggested that the "principles-and-parameters theory" is a useful approach to the explanation of language acquisition in that this approach describes the stages of child language development but limits the number and kind of developmental principles to a set of independently motivated parameters plus lexical/peripheral knowledge. Further research uses of the principles-and-parameters approach for exploring universal grammar, the nature of the developmental process, and second language learning are discussed. (MSE)

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A Principles-and-Parameters Approach to the Study of Child Language

(or 'why isn't language acquisition instantaneous?')

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The Logical Problem

In order to solve the language acquisition puzzle there are two basic problems one needs to address. The first is the so-called "logical problem of language acquisition" and the second is what I will refer to as the "developmental problem of language acquisition." The logical problem of language acquisition is the question, no doubt familiar to you all, of how we account for the richness, complexity and specificity of our shared linguistic knowledge given the limitations of the available data. For example, how do we all know that in the sentence in (1a) Michael and he may refer to the same individual, but in (1b) they may not?

(1) a. Michael said that he was hungry.
b. He said that Michael was hungry.

Obviously, none of us are instructed in such matters and it seems clear that the kind of information which would be necessary for a child to learn such a restriction is not available in any form in the input. Thus, in answer to the logical problem of language acquisition, linguistic theory proposes that the child is endowed with a richly articulated set of innate, specifically linguistic principles. These principles interact with linguistic input to determine a particular adult or target grammar. As you know, this system of innate knowledge is referred to as UG (Universal Grammar) (Chomsky, 1965).

Within current theories of grammar UG is formulated as a parameterized system. That is, there is a set of universal principles, some (or perhaps all) of which have associated with them parameters. Each parameter expresses the limited range of variation that languages exhibit with respect to the principle. Let me give some examples. There is a grammatical principle which specifies that phrases are "endocentric" or headed (Stowell, 1981). Thus, VP contains V, NP contains N and so on. Languages vary, however, with respect to the position of the head within its phrase. Thus, there are left-headed languages such as English in which the head precedes its complements and right-headed languages such as Japanese. By hypothesis the child has prior knowledge of the endocentric requirement. His or her task is to determine the position of the head, first or last, within its phrasal projection. This parameter is set for the child's particular

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language based on certain triggering data in the input.

There is also a system of parameters associated with the Binding Theory. Binding Theory consists of a set of principles specifying the domain within which anaphors and pronominals may be referentially dependent on antecedents. The binding principles state roughly that an anaphor must be bound to an antecedent within a specified syntactic domain D, while a pronoun must be free of an antecedent within some specified domain. However, the value of D varies within limits across different languages. Thus, in English D is the minimal S or NP containing the anaphor or pronoun, while in Icelandic D is the minimal indicative clause. In Icelandic then, the reflexive may in certain instances have an antecedent in a higher clause as illustrated in (2).

(2) Eirikur segir ad Maria elski sig
'Erik says that Maria loves (subjunctive) himself'

Again, the child is faced with the task of determining what the binding domains are for anaphors and pronouns in the particular language he or she is born into.

To take one final example, we have the so-called Null Subject Parameter. UG specifies that all sentences must have subjects; however, languages vary according to whether the subject need be phonologically specified or not. In English and French, for example, a lexical subject is obligatory as illustrated in (3a,b), while in Spanish, Italian, and Chinese it need not be expressed, as shown by the examples in (4).

(3) a. *(I) eat rice.
b. *(Je) mange du riz .

(4) a. (Yo) como arroz.
b. (Io) mangio risotto.
c. (Wo) chr fan.

There are a number of different proposals concerning the precise formulation of the Null Subject Parameter (cf. Jaeggli & Safir, forthcoming). For our present purposes, it is sufficient to note the that choice of one or the other option made available by the parameter gives rise to a number of grammatical properties which distinguish null subject from non-null subject languages. As in the previous cases, the child's task is well-defined. He must set the Null Subject Parameter at the value which is appropriate for the language of his speech community.

From the point of view of linguistic theory the language learner comes to the acquisition task with a questionnaire: Does my language have null subjects? Do complements precede or follow the head within XP? Can anaphors be bound outside a non-local domain, and so on. Ideally, each of these questions can be answered on the basis of readily accessible positive evidence in the input. Once all these questions have been answered, that is once the parameters have been set, the child has the adult grammar of the language, or at least what

is known as the "core" grammar (Chomsky, 1981).

The Developmental Problem

Assuming, as I do, that this picture accurately reflects the basic character of grammatical development, we are presented with the following problem. Linguistic theory treats language development as an "instantaneous" process, which is to say that it idealizes to a situation in which the child has at his disposal all of the principles and parameters of UG and all linguistic data necessary to fix those parameters. But of course, language acquisition is not an instantaneous event and thus we must explain the developmental sequence which ultimately terminates in an adult grammar. This is the second part of the acquisition puzzle which I referred to earlier as the developmental problem.

What then is the relationship between the logical problem of language acquisition and the developmental problem? As I see it, the logical problem and the developmental problem are really two sides of the same coin. Both are concerned ultimately with explaining how the child arrives at an adult grammar. The theory of grammar attempts to explain the apparent ease, rapidity and uniformity of acquisition in the face of impoverished data, (what is often referred to as 'Plato's Problem' (Chomsky, 1986)), while the developmental theory must explain the apparent "difficulties" which the child encounters and the various "delays" which characterize the developmental process. In other words, it is the task of the developmental theory to explain those factors which make acquisition "non-instantaneous" and much of the current research within the principles-and-parameters framework is concerned with precisely this question.

What then accounts for the lack of instantaneity in grammatical development? As one might expect, there are a number of contributing factors. First, as noted earlier, the idealized language learner has access to all of the principles and parameters of UG as well as all of the triggering data. In actual acquisition, however, all of this information may not be immediately available to the child. We know that children are selective in the data they attend to at any point of development. This being the case the child may not in fact have all of the relevant data at his disposal at any one time resulting in real-time delays. As White (1981) has suggested, we may need to distinguish between "input" data, which is always available in the environment, and "intake" data, the data which the child is able to perceive at a particular point in development.

There is also some evidence that not all of the principles of UG are available at the initial state. There appears to be a maturational schedule according to which certain principles at least emerge at later points in development. For example, Borer and Wexler (1987) have argued that there is a specific linguistic principle which must mature before the child's grammar licenses NPs which

have undergone movement.' Prior to this maturational point children will not produce or interpret verbal passives or raising constructions. The absence of this linguistic principle also explains why children overgeneralize the caustive rule to non-causative verbs as in examples such as 'John giggled me" noted by Bowerman (1982). The interesting empirical result of this proposal is that it predicts the co-occurrence in real-time of several grammatical developments. Felix (198) also proposes that there are a number of linguistic principles which are inactive at the initial state.

Apart from maturational factors which slow down the acquisition process, another difficult area is the lexicon, which contains a number of idiosyncratic features associated with particular lexical items, for example, argument structure, phonological form, subcategorization restrictions, and so on. Almost everyone would agree that much of what is in the lexicon must be learned largely on a item-by-item basis and that this takes time. More interestingly, however, there may be certain grammatical developments which are dependent on the learning of lexical properties For example, it may be that the acquisition of sentential complementation is dependent on the child acquiring those verbs which take propositional arguments, such as think and believe. Suppose that mediating between the lexicon and the syntax there are principles of canonical mapping of the sort proposed by Grimshaw (1981), for example, one which states roughly that 'the canonical realization of a proposition is a sentence.' The child learns the meaning of a particular verb and hence whether it takes a propositional argument. He then knows, by virtue of canonical mapping (and other principles of grammar), that S may be embedded inside VP. Prior to learning such verbs, however, he does not have that grammatical knowledge. Such as account might shed light on the experimental results of obtained by Goodluck (1981) and others that children correctly interpret subcategorized infinitival complements such as (5a), while they have great difficulty with non-subcategorized adverbial complements of the sort given in (5b).

(5) a. Pluto told Donald to jump up and down.
b. Pluto hit Donald after jumping over the fence.

By hypothesis, the former are easier because the structure associated with such sentences follows from lexical properties of the higher verb, i.e. tell takes a propositional argument, though this is not the case with adverbial complements.

The central point is that although there are various innate mechanisms in place which allow the child to acquire complex sentences, the emergence of such sentences is delayed for reasons having to do with lexical/semantic development. Experimental studies of the child's interpretation of anaphors and pronouns, for example the work of Chien and Wexler (1987), suggests that lexical learning

may also be responsible for developmental delays in the setting of parameters associated with binding principles. In short the child must learn that himself is an anaphor and him is a pronoun before the relevant parameters can be set.

One final factor which undoubtedly influences the order of development of various properties of grammar is the formal complexity associated with the particular phenomena to be acquired. Thus, all else being equal, if property a is formally more complex than property b, b should be easier to acquire and hence emerge earlier than a. However, we need to be cautious at this point because as was pointed out in the early days of generative grammar, formal complexity is a theory internal notion and not an intuitive one. Within Government-Binding theory a distinction is made between the core grammar of a particular language and the periphery (Chomsky, 1981) The core grammar of a particular language is what results from fixing the set of parameters at one of the permitted configurations. Outside of core grammar is the set of peripheral or marked properties of the language. The periphery might include, for example, exceptions or relaxations of the settings of core grammar or idiosyncratic features of the language which are governed by particular lexical items, for example, the fact that in English verbs like believe allow 'raising to object' as in the sentence "I believe John to be crazy." This construction is rather rare in languages of the world and within the theory of grammar it can only be accounted for by exceptional mechanisms.

In my own work, (Hyams, 1987) I have proposed that the core/periphery distinction explicates a number of aspects of real-time acquisition, for example, the acquisition of complex sentences, mentioned above. Children appear to first acquire the basic sentential phrase structure associated with complements, what we may think of as the core property of these constructions, and, as I suggested earlier, this may be done through a principle of canonical mapping. Only later do they sort out those aspects of complementation which are peripheral, for example, whether the clausal complement to a particular verb is tensed or infinitival. Also, as predicted, raising and other constructions which the theory specifies as marked are relatively late grammatical developments. It is also proposed that the core/periphery distinction explains a number of properties associated with the acquisition of inflectional morphology. One empirical result seems to be that in those languages where inflection is a core property, such as Italian, children have an easier time acquiring the inflectional paradigms than they do in languages where inflection is a peripheral property, such as English and French. Moreover, the development of inflectional morphology can be shown to be directly related to the setting of the Null Subject Parameter (Jaeggli & Hyams, 1987), mentioned above. Without getting into the details of that analysis, the basic idea is that all children start out with a null subject grammar and it is by virtue of learning the core vs. peripheral status of inflection in their language that they either persist with a null subject

grammar or reset the parameter to disallow null subjects Hyams & Jaeggli, in preparation). Thus, simplifying greatly, in Italian inflection is part of core grammar and it is able to license null subjects, while in English, it is peripheral and hence not able to fulfil this grammatical function. The analysis explains a range of acquisition phenomena, in particular, the shift to obligatory subject use in non-null subject languages, the emergence of tense and agreement inflection as it correllates with use of lexical subjects, the appearance of modals in English, and the Verb Second rule in languages like German. It is precisely this kind of "clustering effect" or co-occurrence of grammatical developments which provides some of the strongest support for a parameter model.

To sum up, then, we see that although there are a number of non-trivial factors which conspire to prolong the developmental process beyond the idealized instant, the empirical assumption embodied in the idealization, namely that grammatical development involves fixing a finite number of parameters based on positive data available in the environment, is consistent with the facts of actual development where these have been looked at in any detail. The picture of grammatical development that emerges on this approach is one involving a complex interplay of maturational, lexical (that is, learned), and grammatical factors, which is exactly what we would expect given the magnitude of the cognitive achievment involved.

The Role of Linguistic Theory

Language acquisition research within the framework I have been presenting necessarily proceeds in tandem with linguistic theory and this is where its strength lies, I believe. Any hypothesis concerning a particular linguistic development is accountable not only to the acquisition data and developmental principles, but also to the principles of grammar, which themselves have a broad empirical base. For example, the claim that the English speaking child has misset the Null Subject Parameter carries with it a range of empirical predictions which are derived from the linguistic analysis of the null subject phenomenon in adult languages.

Just as proposals concerning the structure of UG have implications for acquisition, so child language has implications for the linguistic analysis of adult languages and for the theory of grammar more generally. For example, if we note that children find some aspect of language A more difficult than a superficially similar property in language B we might argue that the phenomena in question should be analyzed differently in the two target languages. This is the substance of the analysis of inflection noted earlier in which I argue on the basis of developmental data that inflection may be part of the core grammar of one language but in the periphery of another. In a similar vein, Montalbetti and Wexler (1985) argue for a reformulation of Binding Theory based on evidence from acquisition, and Hyams

and Sigurjonsdottir (1988) propose a reanalysis of long distance reflexivization in Icelandic (mentioned earlier) based on experimental results obtained with Icelandic speaking children.

The road from acquisition data to linguistic theory is not always a smooth one, however. It is often difficult to argue for particular linguistic analyses based on child language data since there are a number of variables (linguistic and non-linguistic) which enter into the acquisition process and a priori any one of these could be responsible for the particular effects which we observe in the data. This is true for both naturalistic and experimental data. However, as we acquire a deeper understanding of those different variables which enter into language development, we are increasingly able to determine when certain acquisition data directly reflect grammatical knowledge and hence when they may well bear on linguistic theory. Thus, although the use of acquisition data poses certain problems, they are practical ones and do not involve questions of principle.

And what of the road from linguistic theory to acquisition data? It is often argued that linguistic theory is in too great a state of flux to be useful in the analysis of child language and that acquisition specialists should wait for the syntacticians to hand over the "right" theory of UG before applying it to the data of child language? The problem with such proposals is that the "right" theory of grammar must account for development (with the caveats noted earlier) and to a certain extent for use (since use of language is not totally divorced from knowledge of language) as well as those areas of more traditional concern such as grammatical variation. Thus, unless we explore the implications that particular linguistic theories hold for language acquisition and use and revise these theories accordingly we have not put the theory to the ultimate test.

There is one final consideration regarding the role of linguistic theory which I would like to mention. Chomsky (1965, 1986) points out that in the study of adult languages there is a creative tension which exists between the goal of adequately describing the range of variation exhibited by different languages and the goal of constraining the class of descriptitve mechanisms in order to achieve a level of explanatory adequacy, that is, in order to restrict the set of grammars made available to the child so that he may converge on the right one given the available data. The same tension exists in the study of language development. We need to describe the stages of child language, that is, the variation which exists in the individual through time. At the same time, however, considerations of explanation require that the class of acquisition mechanisms be constrained in some principled fashion. In this sense the principles-and-parameters theory provides an explanatory theory of development in that it limits the number and kind of "developmental principles" to a set of independently motivated parameters plus lexical/peripheral knowledge.

Future Directions

As for future directions, I think that there are many fundamental questions which remain unanswered, some related to the structure of UG and others to the nature of the developmental process itself. With respect to the latter, we need to determine, for example, which aspects of UG are present at the initial state and which aspects are maturationally determined to emerge at later points of development? Another range of questions concerns the nature of the triggering data and how it is what is mapped onto particular parameter values. For example, do children operate according to a Subset Principle (Berwick, 1982; Wexler & Manzini, 1987) which states that they progress from smaller to larger languages? The answer to this question depends in part on whether parameters indeed generate languages which fall into subset relations. There are also a number of issues related to the core/periphery distinction, or the theory of markedness, however formulated. For example, are peripheral or marked properties of grammar acquired according to different (learning) principles than core grammar? How far can the core/periphery distinction go in explaining certain kinds of developmental variation that we find across children acquiring different languages?

Increasingly, people are attempting to explore adult second language learning within a parameter setting framework, the central question being to what extent is L2 acquisition like first language development. Notice that parameter theory provides a very precise way of formulating that question, namely, do adult L2 learners begin with a default parameter setting like the child does; the answer to this question is probably not. However, L2 may be like L1 acquisition in involving a resetting of parameters from the values assumed in the first language to those of the newly acquired language. As in the case of first language studies, there are strong empirical predictions which follow from this hypothesis, largely related to the clustering effect mentioned above. (For discussion of these issues, see Schwartz, 1986; Hilles, in preparation, and references cited in these works). A closely related area is that of simultaneous bilingual acquisition in children. Both bilingualism and L2 acquisition raise a very interesting question for parameter theory - namely, what does it means to have two coexisting grammars within this framework?

Thus far I have mentioned some open questions which exist in the developmental domain, but research in this area cannot proceed in a vacuum. The more we learn about UG itself, in particular about the kinds of parametric variation that human language exhibits, the more insight we gain into the nature of the developmental process.

References

Berwick, R. 1982. Locality Principles and the Acquisition of Syntax, MIT doctoral dissertation.

Borer, H. & Wexler, K. 1987. The Maturation of Syntax," in Roeper and Williams (eds).
Bowerman, M. 1982. "Reorganizational Processes in Lexical and Syntactic Development," in E. Wanner and L. Gleitman (eds.), Language Acquisition: The State of the Art, Cambridge University Press, New York.
Chien, Y-C. & Wexler, K. 1987. "Children's Acquisition of the Locality Condition for Reflexives and Pronouns," PRCLD 26.
Chomsky, N. 1965. Aspects of the Theory of Syntax, MIT Press, Cambridge, MA.
Chomsky, N. 1981. Lectures on Government and Binding, Foris Publications, Dordrecht, Holland.
Chomsky, N. 1986. Knowledge of Language: Its Nature, Origin and Use, Praeger Publishers, New York.
Felix, S. 1986. Cognition and Language Growth, Foris Publications, Holland.
Goodluck, H. 1981. "Children's Grammar of Complement-subject Interpretation," in S. Tavakolian (ed.), Language Acquisition and Linguistic Theory, MIT Press, Cambridge, MA.
Grimshaw, J. 1981. "Form, Function and the Language Acquisition Device," in C.L. Baker & J. McCarthy (eds.), The Logical Problem of Language Acquisition, MIT Press, Cambridge, MA.
Hilles, S. 1987. "Adult Access to UG," UCLA dissertation abstract.
Hyams, N. 1987. "The effects of Core and Peripheral Grammar on Grammatical Development in Children," unpublished manuscript, UCLA.
Hyams, N. & Jaeggli, O. In preparation. "Setting the Null Subject Parameter," manuscript UCLA & USC.
Hyams, N. & Sigurjonsdottir, S. 1988. "The Development of Referential Dependencies in Icelandic," unpublished manuscript, UCLA.
Jaeggli, O. & Hyams, N. 1987. "Morphological Uniformity and the Setting of the Null Subject Parameter," Proceedings of NELS 18.
Jaeggli, O. & Safir, K. Forthcoming. The Null Subject Parameter, D. Reidel Publishing Co. Dordrecht, Holland.
Montalbetti, M. & Wexler, K. 1985. Binding is Linking," Proceedings of WCCFL IV.
Roeper, T & Williams, E. 1987. Parameter Setting, D. Reidel Publishing Co., Dordrecht, Holland.
Schwartz, B. 1987. The Modular Basis of Second Language Acquisition, USC doctoral dissertation.
Stowell, T. 1981. Origins of Phrase Structure, MIT doctoral dissertation.
Wexler, K. & Manzini, M-L. 1987. "Parameters and Learnability in Binding Theory," in Roeper and Williams (eds.)
White, L. 1982. Grammatical Theory and Language Acquisition, Foris Publications, Dordrecht, Holland.